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What is Claimed is:

- 1 1. A network-based voice communication system comprises:
 - 2 at least one voice communication server computer and
 - 3 at least one call agent computer;
 - 4 said server computer(s) and said call agent computer(s) interconnected by a computer network;
 - 5 said server computer(s) being downloaded with a VOIP server software to receive VOIP calls, and to terminate the calls at an ordinary phone via a termination device;
 - 6 said call agent computer(s) being downloaded with a call agent program to initiate a VOIP session with the said server computer(s) and to allow a caller to input desired data not limited to entering an IP address, selecting one IP address from a directory, entering a telephone number and selecting one telephone number from a directory to facilitate a call;
 - 7 said one server computer and said one call agent computer forming a pair and working under a client-server architecture and the pair jointly managing a VOIP session;
 - 8 Said server computers and said call agent computers in a cluster of multiple units, any number to millions, working under a distributed architecture;
 - 9 whereby the voice communication system serves the basic voice communication
 - 10 needs in a simple, ease-to-install, ease-to-use and ease-to-manage manner
 - 11 with great cost savings and productivity.

- 1 2. A network-based voice communication system in accordance of claim 1 wherein said server computer is equipped with a full-duplex sound card with an appropriate driver supported by the computer operating system for handling digital voice transmission and processing;
- 2 wherein said server software program is programmed to handle a single communication session initiated by the said call agent and to handle the VOIP traffic

7 with communication interface to the standard protocols and voice interface to the said
8 sound card to process voice signal, analog to digital and vice versa, and voice
9 compression and decompression using CODEC module;

10 wherein protocol standards is selected from the family of VOIP
11 communication protocols such as H.323/H.245, RTP/RTCP and SIP; and

12 wherein a CODEC code is selected from the family of G723.1, G729, GSM,
13 H261, H263 and G711.

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2 3. A network-based voice communication system in accordance of claim 1
3 wherein said server computer is equipped with a standards complaint
4 termination device selected from the family of voice modem, PBX and VOIP gateways
5 with an appropriate driver supported by the computer operating system for handling
6 voice traffic and terminating a VOIP call to a PSTN telephone;

7 wherein said server software program is programmed to handle a single
8 communication session initiated by the said call agent and to handle the VOIP
9 traffic with communication interface to the standard protocols, voice interface to the said
10 sound card to process voice signal, analog to digital and vice versa, and voice
11 compression and decompression using CODEC module and interface to the termination
12 device;

13 wherein protocol standards is selected from the family of VOIP
14 communication protocols such as H.323/H.245, RTP/RTCP and SIP and wherein a
15 CODEC code is selected from the family of G723.1, G729, GSM, H261, H263 and
16 G711.

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2 4. A network-based voice communication system in accordance of claim 1
3 wherein the said call agent computer is multimedia enabled with a full duplex
4 sound card, two speakers and one microphone for VOIP application;

5 wherein said call agent program is programmed to initiate a communication
6 session with the said server computer complaint to the standard communication

7 protocols; and wherein the said call agent program is programmed to handle and monitor
8 the voice session with data input, call and hang-up capabilities.

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2 5. A network-based voice communication system in accordance of claim 1
3 wherein said call agent computer has a network interface, a web browser and an e-mail
4 application compatible with said call agent computer operating system for facilitating on-
5 line interaction.

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2 6. A network-based voice communication system in accordance of claim 1
3 wherein the said server computer can be loaded with a call agent program to
4 function as a call agent computer as well;

5 wherein the said call agent computer can be loaded with a VCS server
6 program to function as a voice communication server as well with a termination device
7 added to facilitate VCS system test and additional application such as branch-to-branch
8 voice communication; and

9 wherein a number of said server/call agent computers are organized to
10 perform a tie-line communication function between several branches.

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2 7. A network-based voice communication system in accordance of claim 1
3 wherein at least one of the said server computers can be connected to a
4 specific brand of PBX system so to terminate the VOIP call by dialing the PBX system
5 with less than full length of telephone number code;

6 wherein at least one of the said server computers can be connected to a VOIP
7 gateway device to terminate more than one voice session at a time; and

8 wherein at least one of the said server computers can be connected to a voice
9 modem to terminate one dedicated voice session.

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2 8. A method of establishing a working voice communication system with
3 capability of receiving VOIP calls, terminating such calls at ordinary telephone via a
4 termination device such as a voice modem, PBX and VOIP gateway and designating at
5 least one local phone number into an e800 number as defined in this invention for e-
6 commerce applications comprises of:
7 an automated process for making a request for downloading voice communication server
8 program and call agent software,
9 under the control of a web site supported by a web server and a number of
10 other server functions (mail server, dial-up server, solution server, form/data server)
11 resident in one or more computer servers,
12 displaying information about the voice communication system;
13 responding to requests of downloading the voice communication system;
14 capturing the requester identification and user profile;
15 establishing the system configuration for operating the voice
16 communication
17 system;
18 accepting and submitting the IP addresses for operating the voice
19 communication systems;
20 downloading the voice communication system server software;
21 downloading the call agent software;
22 downloading call agent web icon file, directory and address book;
23 activating the voice communication system server software; and
24 testing and running the voice communication system
25 all in one continuous and sequential one-stop process with freedom to pause
26 the process;
27 under the control of a mail server,
28 authenticating and conveying the registrant's ID code;
29 authenticating and confirming payment received;
30 under the control of a solution server,
31 delivering the voice communication system server software;

32 delivering the default ad image file;
33 delivering the call agent software;
34 delivering the call agent web icon instruction file, web icon file, address
35 book and directory data;
36 under the control of an encryption engine,
37 creating the activation code corresponding to an IP address submitted;
38 delivering the activation code to the requester through the mail server;
39 under the control of a form server,
40 allowing forms to be presented to and filled by the requester
41 under the control of a dial-up server,
42 allowing remote dial-in to perform call agent test
43 under the control of a Voice Communication System server and any number
44 of call agent computers,
45 performing VOIP call test with a call agent;
46 whereby the request of establishing a working voice communication system
47 can be accomplished with a continuous on-line process in the end producing a working
48 voice communication system to serve multiple business entities.

1 9. A system supporting the method in claim 8 wherein the said server
2 functions can be performed by any specified number of computer servers with said server
3 functions divided and served in concert to fulfill the objectives of the claimed method
4 and with said voice communication server and call agent computer having specifications
5 in accordance of claims 1-7

1 10. The method of claim 8 wherein the registration step creates a requester
2 ID code for a requester to suspend and resume the requisition process at will; wherein the
3 activation step creates an activation code to insure said server program from being copied
4 and misused and wherein the activation code can be set to expire within a specified time

5 so that the owner of the activation code must request for reactivation when the activation
6 code expires.

1 11. The method of claim 8

2 wherein the displaying of information includes displaying the voice
3 communication system architecture, system operation procedure, requirement of system
4 configuration, procedures of establishing said system, personal ID, personal profile,
5 system configuration data, download procedure, server program instruction, call agent
6 program instruction, call agent icon image and instruction and ad image file and
7 instruction all by an on-line process;

8 wherein the capturing information includes personal ID, personal profile,
9 system configuration data, firewall specification, IP addresses and telephone numbers;

10 wherein the download processes include VCS server program, call agent
11 program, ad image file, call agent web icon file, instruction for incorporating web icon
12 file, instruction for replacing ad image file with merchant's own ad image file and
13 activating VCS system, including information to reset firewall to permit VOIP
14 transmission; and

15 wherein a number of parties can perform the request, install and any part of
16 the entire procedures simultaneously to construct a multi-party VCS solution to serve
17 themselves and the public.

1 12. The method of claim 8 wherein the activation process includes the usage
2 of an encryption engine to generate an activation code using a number of known
3 algorithms; wherein one algorithm encrypts the said IP address to produce an activation
4 code; wherein the said downloaded VCS server program is imbedded with the
5 corresponding decryption algorithm with the activation code required for decryption; and
6 wherein the said activation code can be a special code which will expire within a
7 specified time so that the owner of the activation code must request reactivation after
8 expiration.

1 13. The method of claim 8 wherein the server software is programmed to
2 allow specific phone numbers to be included in the working directory as well as to allow
3 large group of phone numbers defined by any code, such as country code, area code,
4 specific exchange and any combination of such codes to be included in the working
5 directory; and wherein the complementary of the working directory (reversing the
6 allowed numbers to be not-allowed and vice versa) can be easily activated by a reverse
7 action through a program input.

1 14. A call agent program in accordance of claims 1 and 8
2 wherein the said program acts like a browser window which can receive
3 advertising image file or animation file to be displayed in its user interface and
4 wherein the said program can accept download of data such address book and
5 directory entries.

1 15. A call agent program in accordance of claims 1 and 8
2 wherein the program can be launched from the call agent computer by any of
3 the following means: from web page, from computer screen interface such as desktop
4 and a hand-held telephone with its base station connected to the Internet connected call
5 agent computer;
6 wherein the program contains an address book; and
7 wherein the program contains generic functions not specific to any specific
8 merchant so any merchant can make it downloaded freely from merchant's web page.

1 16. An Internet-based e800 directory system comprises:

2 at least one VOIP gateway computer;
3 at least one call agent computer; and at least one server computer;
4 said gateway computer(s), said call agent computer(s) and said server
5 computer(s) interconnected by a computer network;
6 said gateway computer(s) having termination capability for at least one voice
7 session with a PSTN telephone;
8 said call agent computer(s) being loaded with a call agent program to initiate a
9 VOIP session with the said gateway computer(s) and to allow a caller to input desired
10 data not limited to entering an IP address, selecting one IP address from an e800
11 directory, entering a telephone number and selecting one telephone number from an e800
12 directory to facilitate a call;
13 said server computer having a web server for rendering a web site program to
14 receive request for designating a local phone number to be an e800 number, to list said
15 e800 number in an e800 directory, to display said e800 directory when requested by a
16 requester through a network browser and to facilitate placing a call agent icon next to the
17 e800 number in the e800 directory;
18 said web server computer being loaded with form server program to provide
19 on-line registration and on-line payment processing for accepting purchase of the e800
20 directory service; and
21 said web server computer being loaded with file download program to provide
22 instant download of the call agent program, the e800 directory server program as well as
23 the e800 franchise agreement file.

1 17. A database in accordance with Claim 8 and 16 is used
2 wherein the IP addresses and user profile information and other information
3 collected through interactive sessions are incorporated in the e800 directory and the call
4 agent address book and made available for user to query.

1 18. The web icon of call agent program in accordance with claim 8 and 16 is